CLAIMS

1 – Method of producing a photonic bandgap (PBG) filtering structure on a microwave device, formed by a slot produced on a metallized substrate, characterized in that it consists in forming periodic metal patterns (4, 4a, 4b, 4c, 4d, 5a, 5b, 11a, 22, 32) on the opposite side of the substrate from that receiving the slot and facing the slot.

2 – Method according to Claim 1, characterized in that the periodicity between two patterns is equal to $k\lambda g/2$ where λg is the wavelength of the wave guided in the slot at the chosen bandgap frequency and k is an integer.

3 – Method according to either of Claims 1 and 2, characterized in that the width and the depth of the bandgap depend on the equivalent area of the periodic pattern.

4 – Method according to Claim 3, characterized in that periodic patterns of different shape but of the same equivalent area are produced.

5 – Method according to one of Claims 1 to 4, characterized in that the patterns are produced by etching a metal layer deposited on the opposite side of the substrate from that receiving the slot.

6 – Method according to Claim 1, characterized in that patterns are produced in a PBG structure in which the equivalent area of a pattern can be modified from one pattern to another, with a constant spacing between patterns.

7 – Method according to Claim 1, characterized in that patterns are produced in a PBG structure, in which the equivalent area remains constant but the spacing between each pattern can vary.

8 – Method according to any one of Claims 1 to 7, characterized in that the patterns are formed from discs, squares or rings, or H-shaped elements.

9 – Method according to any one of Claims 1 to 8, characterized in that several different PBG structures are combined with one another.

10 – Microwave antenna consisting of a closed slot produced on a metallized substrate, the slot being fed via a feed line, characterized in that it includes a bandgap structure (22) produced according to one of Claims 1 to 9.

11 – Microwave antenna according to Claim 10, characterized in that the periodicity of the patterns of the PBG structure is chosen so that the bandgap frequency is equal to one of the harmonics of the operating frequency of the closed slot.

12 – Microwave antenna according to Claim 10, characterized in that the periodicity of the patterns of the PBG structure is chosen so that the bandgap frequency is greater than the operating frequency of the closed slot.

13 – Antenna according to any one of Claims 10 to 12, characterized in that the closed slot is an annular slot.

14 – Antenna according to any one of Claims 10 to 13, characterized in that the slot is fed through a slot-line transition via a feed line produced in microstrip technology.

15 – Antenna according to Claim 14, characterized in that a photonic bandgap structure is produced beneath the microstrip line by demetallizing the opposite side of the substrate from that receiving the line.

16 – Vivaldi microwave antenna, characterized in that it includes a bandgap structure (32) produced according to any one of Claims 1 to 9.

17 – Antenna according to Claim 16, characterized in that a photonic bandgap structure is produced along at least one of the profiles of the slot constituting the Vivaldi antenna.

18 – Antenna according to either of Claims 16 and 17, characterized in that the Vivaldi antenna is fed at a slot-line transition via a feed line produced in microstrip technology.

19 – Antenna according to Claim 18, characterized in that a photonic bandgap structure is produced beneath the microstrip line by demetallizing of the side of the substrate receiving the line.